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Dranetz

305-PA-3007

qp-SV

TM-102844A

MP MASTER

MA22500

TM-102844A

INSTRUCTION MANUAL

MODEL 305-PA-3007

FOR

SERIES 305 PHASEMETER MAIN FRAME

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DRANETZ

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SERIAL NUMBER EFFECTIVITY

Instruction Manual TM-102844A provides maintenance and operating instructions for Plug-in Model 305-PA-3007 units determined by the following Serial No. Codes:

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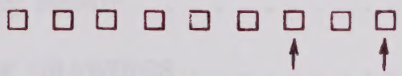
9 DIGIT EXAMPLE



Plug-in 305-PA-3007 Notes:

1. If last digit (9th digit) is 6 or greater and the 7th digit is 3 or greater; this manual applies.
2. If last digit (9th digit) is 7 or greater; this manual applies.

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SECTION 1

GENERAL INFORMATION

1.1 INTRODUCTION

This Manual provides operating and service instructions for the Dranetz Model 305-PA-3007 programmable plug-in. The 305-PA-3007 is designed for use in all Dranetz Series 305 Phasemeter main frames.

1.2 PURPOSE

The purpose of this plug-in is to provide the ability to remotely select input level ranges by external TTL programming and also to provide pre-amplifiers in each channel to extend the lower operating signal level to 1 mv rms. This plug-in also has automatic level range selection which may be used when it is not desirable to program levels. When operating with automatic level selection, the plug-in is nearly identical to the 305-PA-3001 general purpose plug-in. The 305-PA-3001 plug-in is described in detail in Instruction Manual TM-101378A which is supplied with all Series 305 Phasemeter main frames.

1.3 CHARACTERISTICS

The characteristics and specifications of the 305-PA-3007 are as described in Table 1-1.

Table 1-1. Technical Characteristics

Characteristic*	Specification
Input Levels (Signal or Reference)	
Without Pre-amps	50 mV rms to 300 Vrms to 10 kHz decreasing to 50 Vrms above 100 kHz
With Pre-amps	1 mV rms to 100 mV rms
Frequency Range	
Without Pre-amps	2 Hz to 700 kHz
With Pre-amps	20 Hz to 70 kHz
Input Impedance	
Without Pre-amps	1 meg + approx. 100 pf cap.
With Pre-amps	1 meg + approx. 50 pf cap.

Table 2-2. Main Frame Connector J2, Plug-in, All Models

J2 Pin No.	Function	
1	Reference, .05 to 0.5 Vrms	
2	Reference, 0.5 to 5.0 Vrms	
3	Reference, 5.0 to 50 Vrms	
4	Pre-Amp. Insertion	
5	Ckt Gnd	
6	Signal, .05 to 0.5 Vrms	
7	Signal, 0.5 to 5.0 Vrms	
8	Signal, 5.0 to 50 Vrms	
9	Auto level Disable	
10	Ckt Gnd	
11	Ref. Low	Out-of-Limit indicators, +3.2 Vdc ON -0.6 Vdc OFF
12	Ref. High	
13	Sig. High	
14	Sig. Low	
15	Ckt Gnd	
16	NC	
17	NC	
18	NC	
19	NC	
20	+24 Vdc	
21	NC	
22	NC	
23	NC	
24	NC	
25	-24 Vdc	

The attenuator range selections may be externally programmed; or, all external program bits except the pre-amp bit may be set to "0," allowing the internal level ranging circuits to select the correct attenuator range. Do not exceed an input level of 10 Vrms when using the pre-amplifiers.

2.3.4 For operation of the 305-PA-3007 without external programming, all program inputs must be "0". For convenience, a connector is provided with each plug-in. This connector has all program inputs jumpered to a ground pin. When it is inserted into the "PLUG-IN" connector on the Main Frame rear panel, the 305-PA-3007 will function exactly as a 305-PA-3001. Its input range will be 50 mV rms to 50 Vrms with appropriate attenuators automatically selected.

SECTION 3

THEORY OF OPERATION

3.1 GENERAL

The function of the 305-PA-3007 is to accept a wide range of sinusoidal input voltages and generate output square waves with transitions corresponding to the zero crossing of the input sinewaves. The plug-in provides circuits for automatic selection of input amplitude range and also allows remote operation through a rear panel connector. Provision is made for insertion of pre-amplifiers to extend the useful input level range down to 1 mv rms.

3.2 BLOCK DIAGRAM DISCUSSION

Figure 3-1 is a block diagram of the 305-PA-3005. Since signal processing is the same in both Reference and Signal Channels, only the Reference Channel will be discussed in detail.

3.2.1 Block 1 is the pre-amplifier. It has a gain of 50 when switched in and a gain of 1.0 when switched out.

3.2.2 Block 2 is a switched attenuator having gains of 1.0, 0.1 and .01 to provide an output level variation which remains within the 10:1 range of 50 to 500 mv rms.

3.2.3 Block 3 is an amplifier which provides a signal output level of 0.3 to 3 Vrms to the squaring circuit.

3.2.4 Block 4 is the reference squaring circuit. This is an overdriven IC amplifier having the high speed switching action required to precisely define the locations of the zero crossing of its sinusoidal inputs.

3.2.5 The level ranging circuits of block 5 select the correct setting of the attenuator of block 2. The output of the amplifier is detected and compared to two pre-set limits. If it is outside of either limit, the appropriate limit indicator is lighted and the attenuator is switched to correct the out of limit condition. If the condition is not correctable, the out of limit indicator remains on. Provisions are made in block 5 to allow external commands to override the automatic range selection circuits.

SECTION 4

MAINTENANCE

4.1 INTRODUCTION

No routine scheduled maintenance is required by the 305-PA-3007. If it is desired at any time to verify the performance of the plug-in, a test may be run in accordance with the procedure described in paragraph 4-2. If any out-of-tolerance operation is discovered, adjustment should be performed in accordance with paragraph 4.3. If adjustment is not adequate to correct out-of-tolerance operation, repair may be performed using the schematic diagrams along with the information contained in Section 3 and the repair procedure described in paragraph 4.4.

4.2 TEST PROCEDURE

4.2.1 The 305-PA-3007 is similar to the 305-PA-3001 except for the addition of pre-amplifiers and provision for external level range control. Therefore, the first part of the test will be performance of the tests specified in Technical Manual TM-101378A for the 305-PA-3001.

4.2.2 Connect the factory supplied jumper connector to the PLUG-IN connector at the rear of the Main Frame. This causes the 305-PA-3007 to function as the 305-PA-3001. If this jumper connector is not available, merely connect together pins 1 through 9 on the PLUG-IN connector, leaving all other pins open.

4.2.3 Perform the Minimum Performance Test exactly as detailed in Section III of TM-101378A.

4.2.4 To test the pre-amplifiers, connect pins 1, 2, 3, 5, 6, 7, 8 and 9 together on the PLUG-IN connector at the rear of the main frame. Leave all other pins open.

4.2.5 Using the test circuit of figure 3-1 of TM-101378A, perform the tests listed in Table 4-1.

NOTE

An attenuator must be added in series with the output of the signal generator such that 100 mv rms is supplied to the BNC T when the output of the signal generator is set to its maximum level.

4.4 REPAIR PROCEDURE

4.4.1 When a problem is discovered which cannot be corrected by adjustment, repair is required.

4.4.2 A signal tracing trouble shooting technique is recommended. The block diagram and theory of operation in Section 3 provide the repairman with an overall view of the plug-in's operation. Detailed information is supplied by the schematic diagrams included at the rear of this manual.

4.4.3 After a repair, the test procedure of paragraph 4.2 should be performed. If any out-of-tolerance operation is observed, it may be corrected by adjustments as detailed in paragraph 4.3.

4.5 FACTORY REPAIR

When factory repair is desired, proceed as follows:

1. Contact the Dranetz Engineering Customer Service Department and obtain an Authorization Number.

2. Fill out the Repair/Service Order enclosed in this manual and ship it with the equipment to the Customer Service Department.

CUSTOMER SERVICE DEPT.
DRANETZ ENG. LABS., INC.
2385 So. Clinton Ave.
So. Plainfield, N.J. 07080

REPAIR/SERVICE ORDER

TEL. (201) 755-7080
TWX: (710) 997-9553
CABLE: DRANETZ

NOTE: THIS COMPLETED FORM MUST ACCOMPANY RETURNED EQUIPMENT

CUSTOMER SHIPPING & BILLING INFORMATION

CUSTOMER P. O. # _____ P. O. DATE _____

SHIP TO: _____ INVOICE TO: _____

In Continental U. S., material will be returned by Dranetz to you by UPS, UPS Blue or other carrier chosen by Dranetz unless otherwise designated.

EQUIPMENT BEING RETURNED

Date of Original Purchase: _____ Original P. O. # _____

Model No. _____ S/N _____

Model No. _____ S/N _____

Ancillary equipment also being returned (If you neglect this, these items may not be returned to you).

☐ Power & Other Cables _____ ☐ Instr. Book _____

☐ Plug-ins (incl. S/N) _____ ☐ Connectors _____

☐ Other _____

RETURN AUTHORIZATION

Have you discussed the problem with Dranetz Sales or Service personnel?

Dranetz Return Authorization # _____

By: _____

If so, with whom _____ Date: _____

Whom should the Dranetz Customer Service Dept. contact for technical questions?

_____ ( )

NAME (Print) DEPARTMENT TELEPHONE

DESCRIPTION OF PROBLEM

Please be detailed, explicit and complete. Include test data, if this helps to describe the problem.
IMPORTANT: Repairs cannot be made unless this section is completely filled out.
(Attach added sheets if necessary)

CHECK WHERE APPLICABLE: IS MALFUNCTION RELATED TO: Warmup ☐ Temperature ☐
Intermittency ☐ Mechanical Handling ☐ Visual Defects ☐ Grounding ☐ Test Data Attached ☐

INITIATOR OF THIS ORDER

NAME/TITLE SIGNATURE TELEPHONE

(SEE OTHER SIDE FOR INSTRUCTIONS)

IMPORTANT (ENCLOSE THIS ENTIRE FORM WITH EQUIPMENT)

SECTION 5

REFERENCE DRAWING

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5-2	102845	Card 1 and 2 Assembly
5-3	102846	Card 1 and 2 Schematic Diagram
5-4	102147	Card 3 and 4 Assembly
5-5	102149	Card 3 and 4 Schematic Diagram
5-6	102150	Pre-Amp Assembly
5-7	102152	Pre-Amp Schematic Diagram

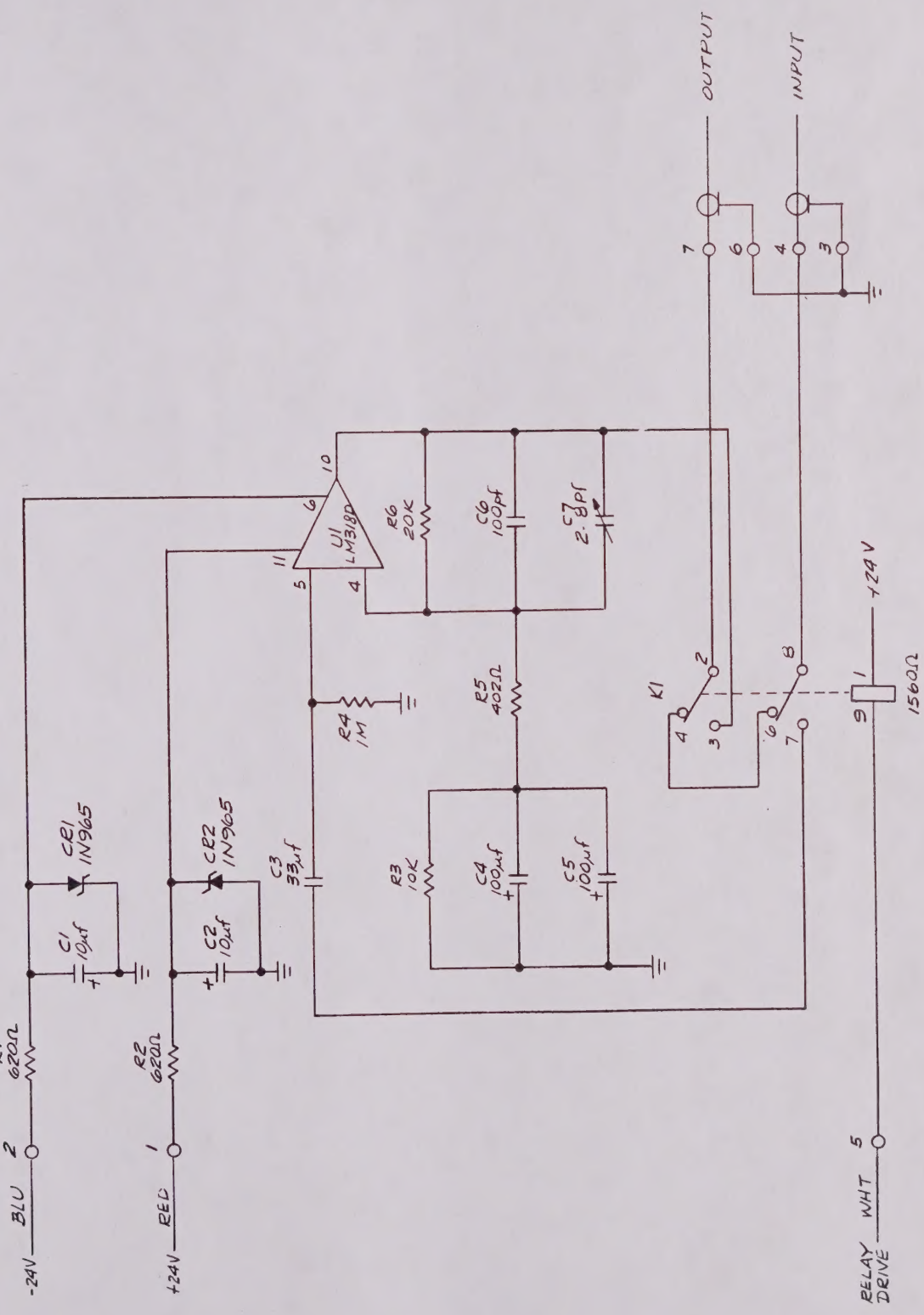

Figure 5-7. Pre-Amp Schematic Diagram (102152E)

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